PITSTONE QUARRY RESTORATION

OVERVIEW OF DESIGN DEVELOPMENT

Image curtusey of Snapshot Visuals showing 2024 design submission

Report Prepared by

AA Environmental Limited

January 2026
Revision B

Overview

1.1 AA Environmental Ltd (AAe) was commissioned in 2019 by Clark Contracting Limited (CCL) to re-assess previous restoration schemes and develop a revised landscape scheme for Pitstone Quarry. The objective was to provide an exceptional restoration scheme, repairing the damage caused by the mineral works to the Chilterns National Landscape, achieving a high quality habitat restoration and providing managed recreational opportunity.

Site Context

1.2 Pitstone Quarry covers an area of approximately 60 ha located to the south-east of the settlement of Pitstone and north-east of the settlement of Tring, on the edge of the Chilterns chalk escarpment. It is bordered to the north-west by the B488 Upper Icknield Way and to the south-west by Northfield Road. The site is located within the Chilterns National Landscape, formerly called an Area of Outstanding Natural Beauty (AONB), and partly within the Metropolitan Green Belt.

1.3 The current landform is heavily influenced by the site's history of, and continuing, quarrying use. The site is lowest at its southwestern corner and rises to the north and east. Pitstone Hill is located to the east of the site, and quarrying activity has cut into the scarp slope which runs along the hill's north-western flank. There is a groundwater fed lake in the western corner of the site where the ground has been excavated to the lowest level in the site. The surface level of the water varies but is typically at 120m Above Ordnance Datum (AOD). The level has been recorded between 119 and 124 m AOD. Groundwater has been monitored as flowing to the northwest. There is a spring offsite to the northwest.

1.4 The site lies in a rich biodiverse landscape, with agricultural land intermixed with chalk meadowland, woodland and scrub. There are a number of Sites of Special Scientific Interest located close to the site, including Pitstone Hill on the eastern boundary and Aldbury Nowers to the south. Further east is the Chiltern Beechwoods, designated as a Special Area of Conservation. The south west corner of the site is a lake, which is primarily groundwater fed, and provides a rare ecological environment. The lake within the site and the Berks, Bucks and Oxon Wildlife Trust College Lake Nature Reserve (located west of the Pitstone Quarry) are designated as Local Wildlife Sites.

1.5 Close to the site, the Ridgeway National Trail and Icknield Way pass over Pitstone Hill, above the quarry. The footpath network is extensive and connects into to the Chilterns National Landscape and provides access to important viewpoints. Prior to quarrying activity, Pitstone Village was connected to the hill by a footpath that crossed the northern extent of the quarry, connecting with Vicarage Road. This was diverted around the north of the site when quarrying commenced.

1.6 The land is bounded to the west and south by the local road network, with access off the B488 Upper Icknield Way. The land located to the east of the site forms part of the Ashridge Estate, owned and operated by the National Trust. The land to the north is owned by a local farmer and used for grazing.

Summary of Planning History Relating to the Restoration Detail

Background

1.7 Proposals for a cement works at Pitstone were approved in 1937, and three chalk quarries were developed to supply the cement works, including the current site, which comprises part of Quarry 2 and is the remaining operational area of Pitstone Quarry.

1998 Restoration Proposals

1.8 Plans for working and restoration of Pitstone Quarry were submitted to the relevant planning authorities in 1998 and approved in 2000. The approved restoration plan was prepared by Colvin and Moggridge and follows the principals of what is commonly termed a 'low level restoration' requiring no import of engineering fill. The proposed restoration included spreading topsoil over the existing levels and retention of the groundwater fed lagoon in the southwest of the site. The quarry was to be restored to pasture land, with the Phase 2 area more intensively farmed.

1.9 The low-level restoration provided only small-scale re-engineering of the quarry sides and integration with the lagoon. The review of the proposed restoration scheme has identified that to achieve the proposed levels, the site requires significant further mineral extraction. A drone topographical survey was completed in the summer 2023 and the reserves estimated as 579,000 m^3. In May 2025, the residual reserved exceed 550,000 m3. At current extraction rates it is estimated that the restoration would not be complete until 2062, some 20 years beyond the current term of the extant planning permission, without Phase 3 of the restoration being progressed.

Figure 1. Extant Restoration Plan with colour overlay by Portis + Whitton (2024)

Chapter 1. Introduction

2003 Application

1.10 A revised restoration proposal was submitted by Clark Contracting Limited in 2003, relating to an area of approximately 12ha located solely within Buckinghamshire. The restoration proposals accompanying this application included filling an existing void within Quarry 2 with inert construction and demolition waste; a material recycling facility at the base of Pitstone Hill with associated waste used to fill the void; importation of clay to form a lining to the landfill; and retention of the existing compound area. Restoration proposals sought to better reflect the surrounding landform; habitats included chalk grassland with tree and scrub planting, rather than improved grassland; development of an internal footpath network; and creation of an island within the lagoon for use by wildlife. Restoration proposals for the southern part of the site were not included. The partial restoration of the quarry required 579,000 m^3 of material. Inert wastes are defined by the Government as '*waste that does not undergo significant physical, chemical, or biological changes and does not react, biodegrade, or harm the environment*'.

1.11 Buckinghamshire Council (formerly known as Buckinghamshire County Council) and Hertfordshire County Council resolved to approve the 2003 application, subject to conditions. However, planning permission was not granted due to the lack of agreement from third parties. The proposal was revised in 2008 and reviewed by Buckinghamshire Council. The Chilterns Conservation Board (the body responsible for management of the Chilterns AONB) objected to the landfilling and recycling elements of the scheme, for reasons including:

- *"The noise and visual disturbance of the recycling operation and landfilling would outweigh the long term advantage of a more natural final landform;*
- *Only part of the quarry would be filled and a large area would remain with vertical faces and therefore the final landform would not be as natural as first thought"*

1.12 Buckinghamshire Council refused the application in March 2011, citing the following reasons:

1) The development would not meet an identified waste management need consistent with the policies for local and regional wastes and therefore is contrary to Policy 10 of Buckinghamshire Minerals and Waste Local Plan 2004-2016.

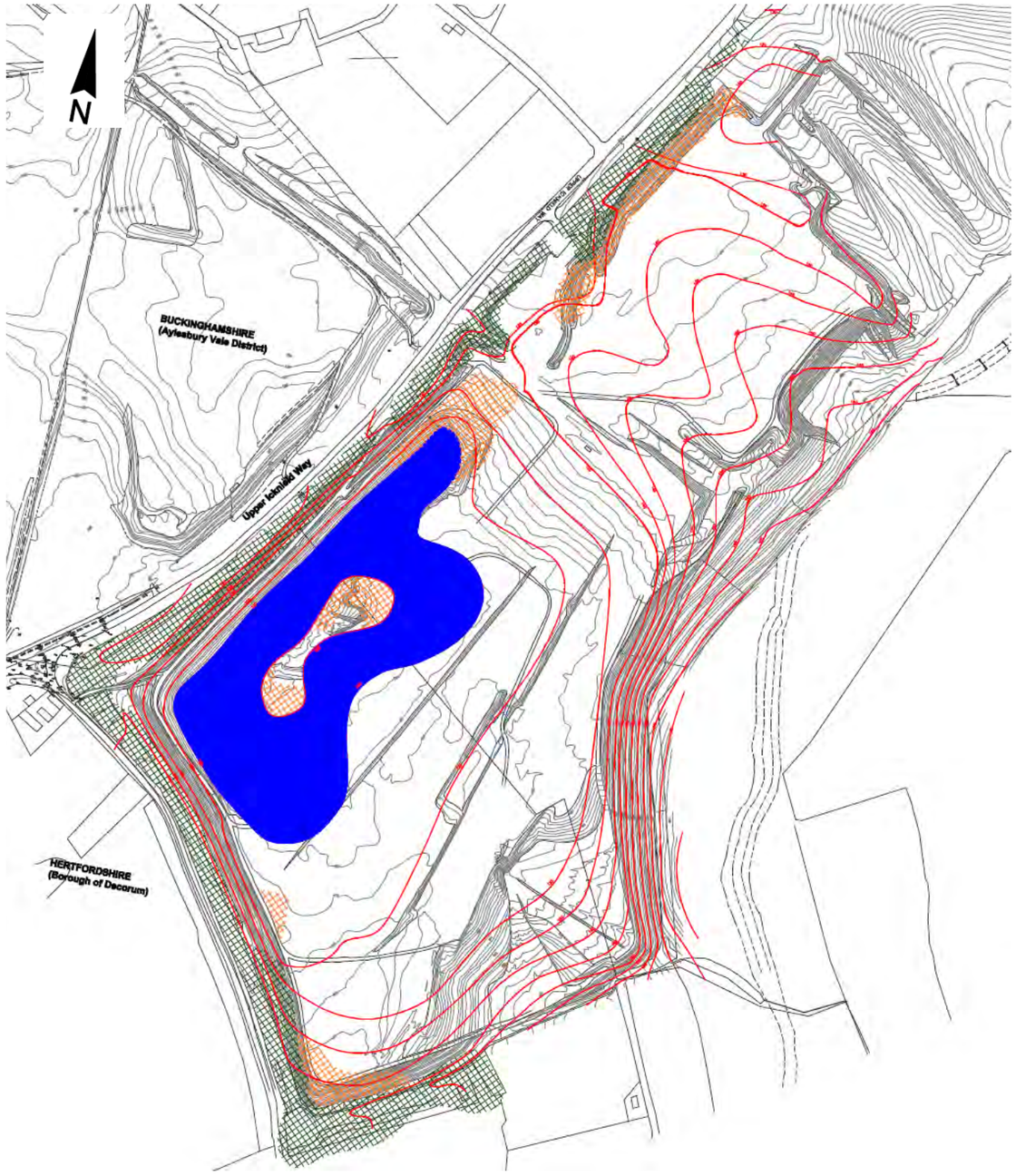
2)The applicant has not demonstrated that there are no suitable alternative sites for a material recovery facility that are not located in the open countryside therefore the proposal is contrary to Policies 10 and 13 of the Buckinghamshire Minerals and Waste Local Plan 2004-2016.

3) The development would have a significant adverse impact on the character and appearance of the Chilterns Area of Outstanding Natural Beauty and the applicant has not demonstrated that the development would be in the national interest and no alternative sites are available that would justify the harm. Therefore, the policy is contrary to Policy 24 of the Buckinghamshire Minerals and Waste Local Plan 2004-2016.

4) The applicant has not demonstrated that very special circumstances exist to justify the use of the land for waste management purposes in the Green Belt and has not demonstrated that there are no alternative sites outside of the Green Belt therefore the proposal is contrary to Policy 27 of the Buckinghamshire Minerals and Waste Local Plan 2004-2016.

1.13 With the refusal of the 2003 application in 2011, the 1999 Colvin and Moggridge restoration plan continues to be the approved plan.

Figure 2. 2003 Proposed Restoration Plan



Chapter 2. Design Development

Revised Restoration Scheme

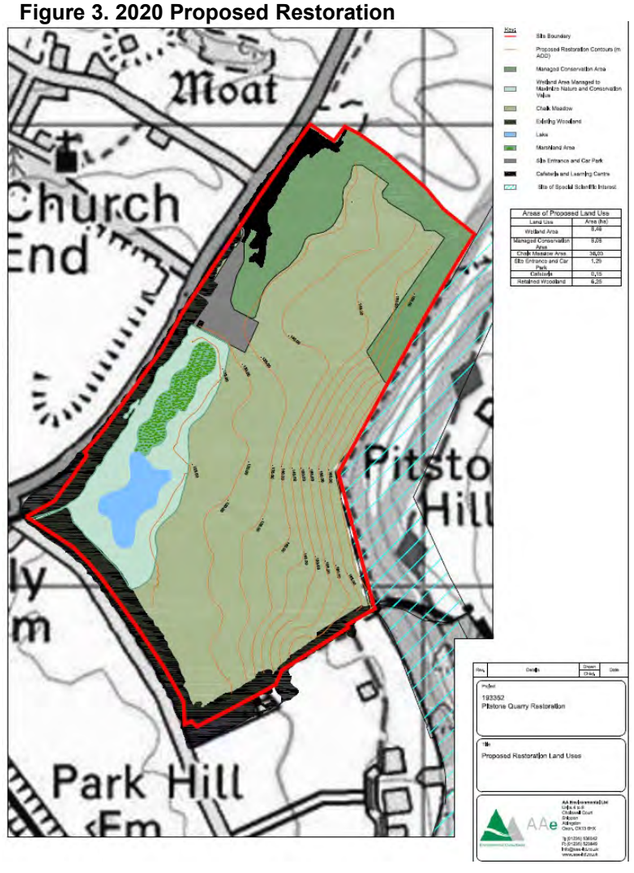
2.1 In 2019 CCL became were aware that they were out of sequence with the approved restoration scheme. CCL recognised that they were potentially behind the required extraction rate necessary to deliver the restoration by 2042. CCL commissioned AAe to project manage the development of a revised restoration scheme that would address what are considered the limitations of the approved Colvin and Mogridge low level restoration scheme and to prepare the planning application.

2.2 The initial assessment identified poor connectivity with the wider chalkland landscape, limited enhancement of the wetland area and offered little in terms of recreational opportunity and access to the Chiltern's Countryside, which are all key aspects of the Chilterns Area of Outstanding Natural Beauty Management Plan 2019–2024. The landscape limitations of low-level restorations are an acknowledged weakness in the design approach with the potential to create alien landscapes to those around. The approved design approach is considered to poorly re-integrate the quarry into the nationally important Chilterns chalk landscape, and consequently is considered to fail to meet the current, and emerging planning policy, including the Hertfordshire and Buckinghamshire's Local Waste Plans.

2.3 The 2003 submission has been similarly assessed during the development of this proposal and whilst considered to sensitively restore the northern section of the quarry, it did not address the steep alien faces in the southern section of the quarry. In addition, whilst achieving landscape objectives, the restoration also partially infilled the cliff exposure, which is considered of geological importance, limiting the potential educational opportunity.

2.4 In 2020, AAe developed an initial concept design, following a similar restoration in the north but completing the landscape in the southern area. The design and potential for long term stewardship was discussed with the National Trust in this phase. The design is presented in Figure 3. It was estimated that 1.5 million m³ of material would be required to complete this full site restoration. This scheme included infilling the cliff exposure of geological importance. The submission also included a café and educational centre. A request for pre-application advice was sought from Buckinghamshire Council and Hertfordshire County Council. The initial pre-application response raised concerns regarding the impacts on the Metropolitan Green Belt and comments were received querying the need and transport movements.

Figure 3. 2020 Proposed Restoration



2.5 Following the concerns raised during the pre-application approach, AAe and CCL sought advice and input of Land Use Consultants Limited (LUC), who have undertaken significant chalkland characterisation in the local region, on behalf of statutory bodies including the Chilterns District Council (now part of Buckinghamshire Council) and Buckinghamshire Council.

2.6 In December 2020, further dialogue was had with the National Trust, regarding the need for a revised restoration scheme and the potential benefits to both parties for a collaborative approach to the design. Whilst interested, the National Trust wished to see the next phase of design before any commitment would be made.

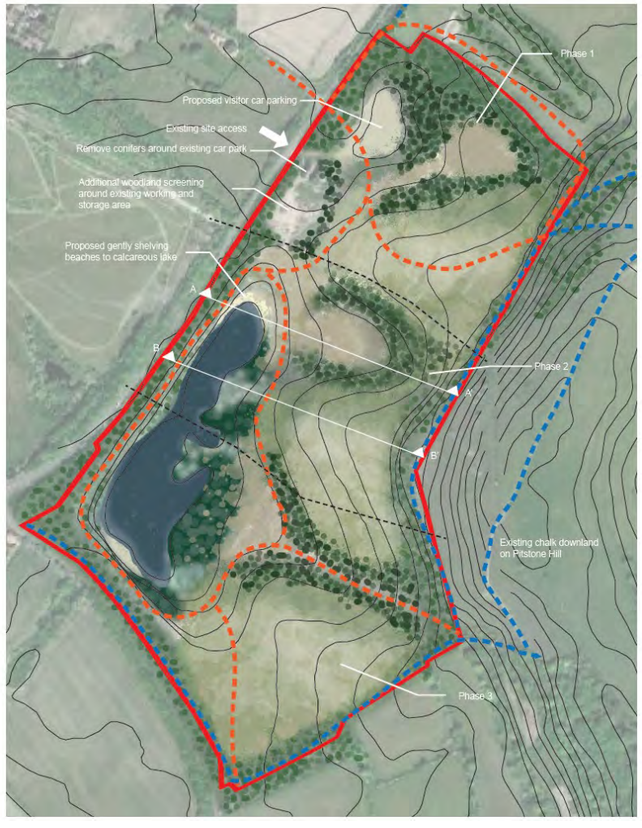
2.7 In January 2021, CCL commissioned LUC to undertake a full redesign of the scheme. LUC were provided a free reign to design a scheme that could best repair the damage mineral activities had on the AONB. Options considered included:

- a varied low level restoration. Whilst with additional material, this option was considered to continue to result in a poor quality landscape restoration and was subsequently abandoned;
- the full restoration of the site to pre-mineral extraction levels. This was estimated to require in excess of 10 million m³ of inert material and would include the infill of the chalk lagoon and its emerging habitats. The scale of this import was considered impractical to achieve, including within the project timeline; and
- an engineered approach, using the import of inert sub-soils and mineral wastes, to permit better integration of the quarry walls into the landscape. This option was progressed into further concept design.

2.8 Following commission, LUC presented a redesigned restoration, presented in Figure 4. The design introduced three distinct valleys and slopes, creating rolling hills integrating with the quarry floor. The design reconnected the surrounding chalklands with the quarry floor. The objectives of the design sought to:

- Enhance the final restored landscape, re-connecting it with the Chiltern foothills and valleys, minimising and repairing the damage caused by the mineral workings including in the southern section of the quarry;
- Provide a biodiverse restoration scheme and a commitment to high quality restoration;
- Create a site wide chalkland with associated habitats; and
- Provide recreation opportunities promoting sustainable access for all, that can absorb a high intensity of use.

Figure 4. LUC Initial Concept Design (July 2021)



2.9 The LUC design was presented to the National Trust in August 2021 to progress discussions of a collaborative approach. In Autumn 2021, it was agreed that CCL and the National Trust would establish a series of collaborative working groups to develop the design. At this stage, the National Trust similarly confirmed their interest in becoming the long-term stewards of the land post cessation of mineral activity.

Chapter 2. Design Development

2.10 The principles in the 2021 LUC concept design have remained at the core of the proposed restoration design, however it has been refined through collaborative workshops with the National Trust local and regional management teams.

2.11 The following key amendments were made to the design through this process through 2022:

- The existing cliff face, considered by Chilterns Society to be of regional importance, has been retained in the design. This provides both geological interest and provides historical links back to the sites use as a mineral quarry;
- A dedicated carpark would be provided for visitors with, subject to further design, a separate access from the B488;
- The restoration contouring was revised to reduce the required volume of fill material necessary from 3 million m^3 in the concept design to 1.8 million m^3;
- A network of footpaths would be constructed across the site. The footpaths were sensitively routed, to provide views of the landscape and local wildlife; whilst minimising disturbance. The site was designed to connect to the local public right of way network, promoting access beyond the boundaries of the site into the Chilterns, including the Ivinghoe Beacon and Pistone Windmill. The footpaths included routes that were suitable for all to access;
- A picnic area in Phase 2 where the current haulage yard is located;
- Three chalk conical landforms, consistent with stockpiles during mineral operations, to be constructed at the access to the parkland as a landmark feature;
- Welfare facilities, however there would be no café or education centre;
- The lake would have a dual land-use: the east of the lake area would be set aside for wildlife and biodiversity; and the western section of the lake (which is deeper and more engineered) would be available for open water swimming. The 2022 design included a beach area and an access platform; and
- The scheme was designed to be delivered in two distinct phases:
    - o A parkland of 35 ha would be created in a 2 year period across the north and the southwest of the site. The lake would be enhanced in this phase, creating more naturalistic shape and providing a variety of wetland habitat. All land formation works in Phase 1 would be completed with site derived chalk. Phase 1 would enable immediate habitat regeneration and managed recreational space for local residents. Footpaths would be constructed permitting circular routes which are accessible for people of all abilities. On completion of Phase 1 the land would be gifted to the National Trust who would manage the habitat restoration and access to the site;
    - o The residual 24 hectares in the southeast of the site would be re-engineered by an import of 1.8 million m^3 of inert sub-soils and excavation arisings. The scheme would be completed over a 15 year period. The imported material would be imported, placed and shaped under an Environmental Permit. Once a section was formed it would be capped by site derived chalk.

2.12 The proposed 2022 design is presented in Figure 5. In Autumn 2022, the proposals were published on the project website (https://pitstone-quarry.co.uk/) and the scheme was promoted to the local community. Interested parties were requested to provide feedback on the scheme. Table 2.1 presents a summary of the comments received via the website and to the project email.

Table 2.1 Consultation responses

Response type	Number	Summary of comments
Supportive	62	The scheme was well received. A significant proportion were supportive of the provision of open water swimming. Feedback was also supportive of the approach towards ecology/biodiversity and the provision of footpaths providing connectivity to the surrounding landscape.
Neutral	15	Most were generally accepting of the scheme but would have liked to see the inclusion of cycle paths on site. Others had concerns relating to the import of material onto the site and associated traffic.
Negative	1	The one negative comment related to concerns about the existing ecological features on the site and the impact of allowing dogs unrestricted access.
Total	78	

Figure 5. LUC Master Plan (October 2022)

Chapter 2. Design Development

2.13 Following publication of the initial Master Plan in Autumn 2022, there has been extensive consultation and design development. Consultation included a local community drop-in session. Consultation has also been undertaken with the following organisations:

- Buckinghamshire Council Highways;
- Natural England;
- Parish Councils;
- Local Community drop in session (attendance exceeded 100 people);
- Bucks, Berks and Oxon Wildlife Trust;
- Chilterns Society;
- Chilterns Management Board; and
- The Chilterns Society.

2.14 The feedback received has been predominantly supportive of the scheme, however the following concerns have been raised relating to the design:

- There is limited opportunity for open water swimming in the region and this offering at the site has been positively received. However, the inclusion of a beach area was considered a negative aspect of the design. The site is subject to trespass activity, inconsistent with the project objectives and the beach was considered a feature that could attract this trespass activity. The trespass activity has created anti-social behaviour and resulted in significant fly tipping, including glass, plastics and nitrous oxide containers;
- Concerns were raised relating to the volume of fill, the number of HGV movements and potential risk of pollution to the underlying aquifer and the lake;
- The connections of the internal footpaths to the tracks to the north were not feasible. The track constructed at the outset of the quarry across the north of the site is no longer present; and
- The secondary access for visitors to the parkland was assessed as unsafe by the Transport Consultants.

2.15 The design of the scheme was further evolved during 2023 and early 2024 to address the concerns raised. The following amendments were made:

- The beach area was removed from the design and access would instead be from the dedicated platform. The beach area would have a planting design to discourage informal access into the lake;
- Access of visitors using the lake for open water swimming is to be controlled with limited numbers permitted;
- The internal footpaths were re-routed;
- Access into the site is from the current main access which, with minor modification, has been assessed as safe to accommodate the high number of visitors and the Heavy Goods Vehicles delivering materials to the site for the formation;
- It was not possible to reduce the volume of material required to generate the proposed landform, however controls are within the application design and site management to ensure materials received are acceptable and no pollution occurs. This includes a geological barrier which attenuates any leaching potential pollutants. The underside of the barrier was designed at 126 m AOD.

2.16 The landscape design concepts were presented in the LUC April 2024 report 'Pitstone Quarry Landscape Restoration: Landscape Design Principles and Materiality' which is attached in Appendix A. The Master Plan for the development is presented in Figure 6.

2.17 Photomontages and visualisations have been developed to provide a visual representation of how the proposed development will look and develop over time from various viewpoints surrounding the site. Snapshot Visuals carried out the work. The methodology is presented in the Portus+ Whitton report 'Type 4 Visualisations: Methodology and Survey data (reference PWN_16_02) and the results provided on a standalone basis within the planning application.

Figure 6. Pitstone Quarry 2024 Restoration Master Plan

Chapter 2. Design Development

Post application design development (2025)

2.18 The Planning Application, supported by a detailed Environmental Statement, was submitted to Hertfordshire County Council and Buckinghamshire Council in October 2024.

2.19 Although the overall landscape principles remain consistent with those set out by LUC in the 2024 application, comments received, together with a formal Regulation 25 request for further information, required design amendments. These have been reassessed in an Addendum to the Environmental Statement (January 2026).

2.20 The main design changes are summarised below:

- **Wetland ecological value:** Hertfordshire County Council and Buckinghamshire Council Ecological Officers identified the shallow lake area as ecologically important. Additional botanical, bird and invertebrate surveys and assessments were carried out in spring/summer 2025. This work confirmed the significance of the wetland drawdown zone. The design now retains the size of the wetland and minimises impacts on shallow strata. Regenerating habitats around the site have been protected where possible.
- **Groundwater assessment:** The Environment Agency requested further evaluation of historical groundwater fluctuations at and around the quarry. Existing and new borehole data has been reviewed by the project hydrogeologist, leading to an adjusted geological barrier level to ensure water-quality protection.
- **Footpath connectivity:** Following consultation with Buckinghamshire Council's Strategic Access Officers, the footpath layout has been revised. The design reinstates footpath P/S/7/12 along the former PROW alignment and enhances connections north and south of the site. Quarry access will be available 24/7 on foot.
- **Landscape character:** Buckinghamshire's Landscape Team expressed concern about the proposed 'Parkland' feel. In response, the design has been simplified: chalk-cone stockpiles removed, internal fencing reduced, viewing areas simplified, and fewer benches/signs included—creating a more open landscape with softer engineering.
- **Access arrangements:** Although the car park will close at night (6 pm in winter, 8 pm otherwise), access by footpath P/S/7/12 remains available 24/7.

2.21 The landform has been redesigned while maintaining visual integration with the surrounding area. The wetland drawdown zone below 123 m AOD has been increased, and no further deepening of the shallow lake is proposed to protect ecological features. Wintering-bird disturbance will be avoided through seasonal controls. The northern area of the restoration land formation remains largely unchanged. The design allows early formation and protection of the wetland to support habitat development from Year 1.

2.22 Additional boreholes previously installed by Castle Cement were identified and fitted with level loggers. Combined with a new borehole installed in March 2025, this has enabled detailed groundwater level monitoring through spring, summer, autumn and into the 2025/26 winter.

2.23 The expanded groundwater dataset has been assessed using precautionary principles and reviewed with the EA. As a result, the geological barrier level in Phase 2 has been raised from 126 m AOD to 127.5 m AOD in the west, rising to 128 m AOD in the east. Inert subsoils and minerals will be placed over the 1 m geological barrier to achieve the land-raise design and then capped with site derived chalk. These updates are incorporated into the revised Hydrogeological Risk Assessment (HRA). The HRA will be further developed with the ongoing data during the Environmental Permit process.

2.24 Footpath and cycleway provision has been reassessed. Improved connectivity with routes to the north and south is now included. A new 800 m cycle/footpath will run through the western edge of the quarry to the Pitstone Quarry entrance, avoiding tree loss and impacts on bats or badgers. A further footpath section has been added in the northeast.

2.25 Other access enhancements include cycle racks, blue-badge bays, EV charging and upgraded crossing points along Upper Icknield Way.

2.26 These improvements are considered to significantly enhance footpath connectivity around the quarry and strengthen the wider Public Rights of Way network offering different routes into the Chilterns National Landscape including the trails across the Ridgeway. As part of this offering, the former west to east PROW linking to footpath PIS/12(F) on Pitstone Hill will be reinstated on its original alignment.

2.27 The project objectives to create a significantly improved landform, enhanced biodiversity and public recreation, has been achieved through careful redesign and proposed construction and long term management. Alongside the expanded wetland, car park and the edges of the quarry, three land management areas have been created to enable grazing, recreation (including dog walking), and habitat development to be effectively managed. The National Trust will rotate grazing and access to ensure sustainable habitat management and prevent pressure from overuse.

2.29 The revised Master Plan is provided in Figure 7. Updated Master Plans and General Arrangement drawings accompany the Regulation 25 response.

Chapter 2. Design Development

Figure 7. Pitstone Quarry Restoration 2025 Master Plan

APPENDIX A
2024 LUC Landscape Design Principles

AA Environmental Ltd
January 2025

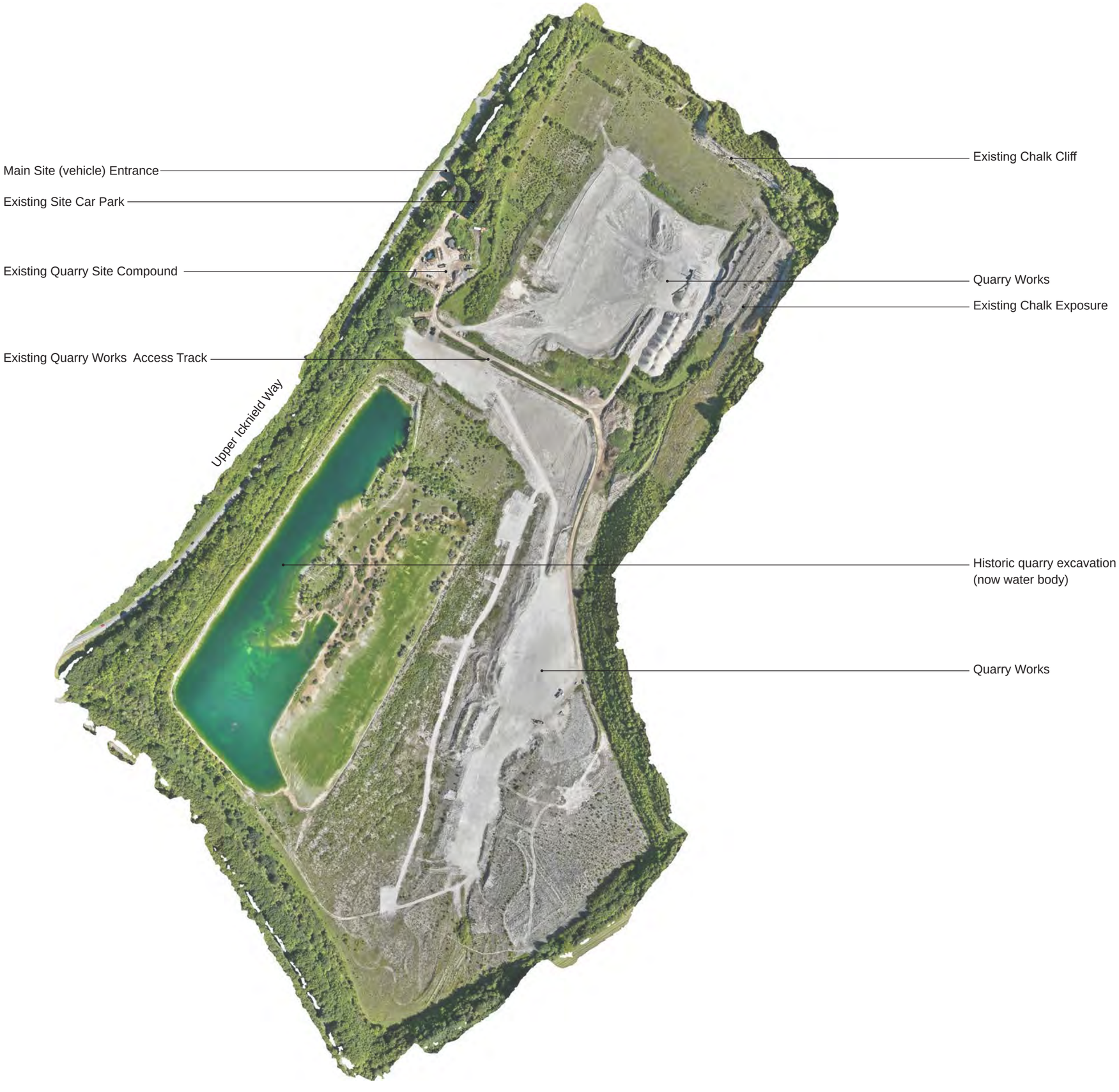
Pitstone Quarry
Landscape Restoration

Landscape Design Principles and Materiality

12732-LUC-SH-001

Version 2.00
September 2024
Prepared by LUC

Existing Site
2023



Landscape - Illustrative Masterplan

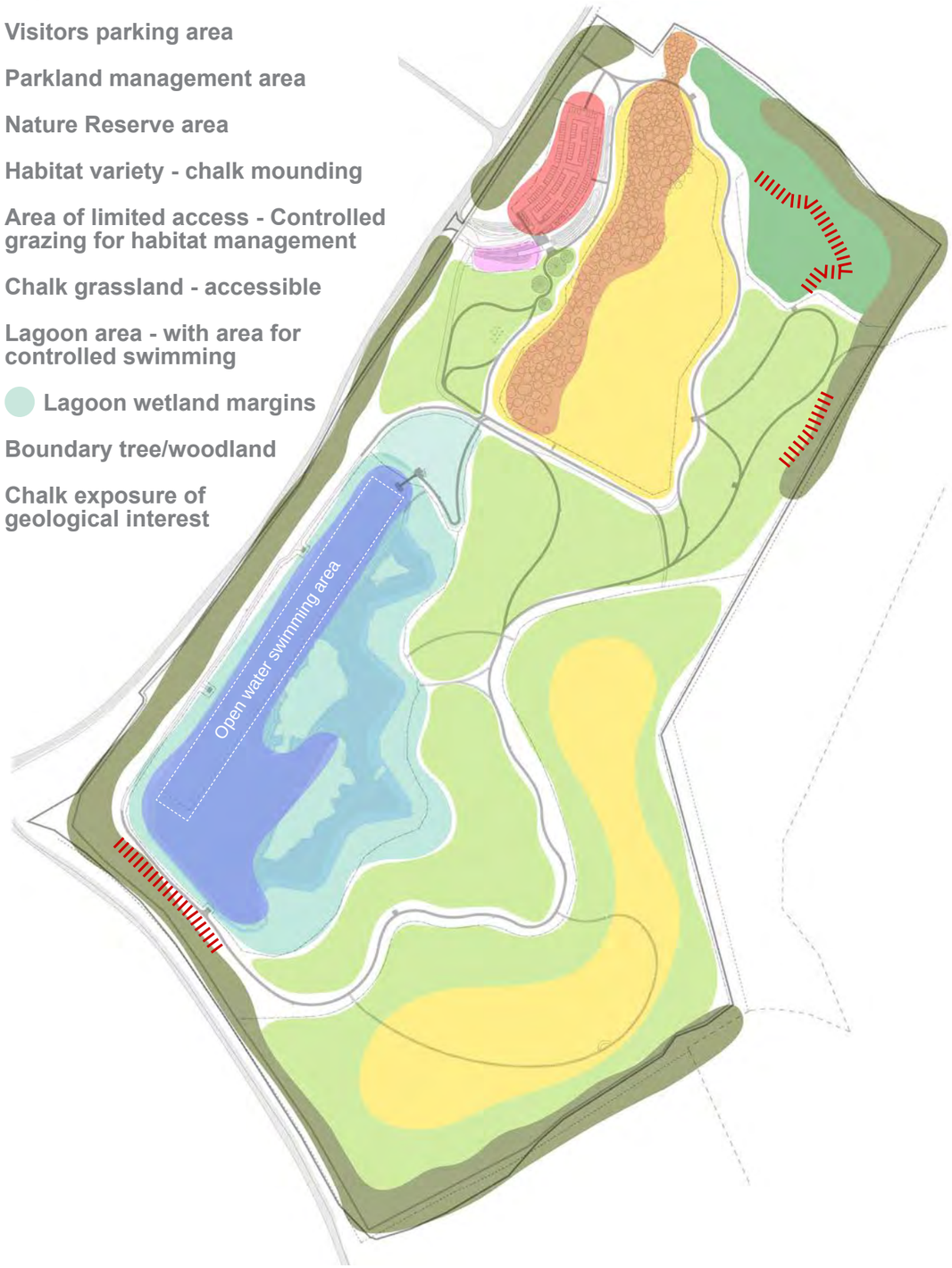
Phase 1 - Partial Restoration / Active Quarry Site

Phase 2 - Completed Land Restoration

Landscape materiality
Character areas - Site wide

Key

- Visitors parking area
- Parkland management area
- Nature Reserve area
- Habitat variety - chalk mounding
- Area of limited access - Controlled grazing for habitat management
- Chalk grassland - accessible
- Lagoon area - with area for controlled swimming
- Lagoon wetland margins
- Boundary tree/woodland
- Chalk exposure of geological interest



Chalk grassland managed by grazing

Chalk mounding to promote ecological diversity. Image: Aston Clinton Rag Pits SSSI (chalk quarry site)

Restricted access - nature reserve and area of geological interest

Lagoon - exisitng water body

Indicative image: gravel surface - 120 spaces car park set within native tree planting to provide screening and shade

Regenerated chalk grassland

Landscape materiality
Hard surfacing: Site-wide

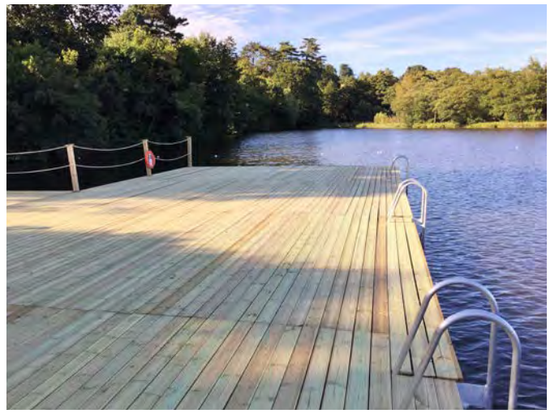
Key

- Crushed limestone unbound paths
- Timber decking to viewing terraces
- Water access - timber deck pontoon / lake observation terrace
- Timber bird screen / wall
- Existing hard standing path (concrete)
- Existing vehicle track way retained for maintenance access
- Unsurfaced path

Crushed limestone unbound paths - 2.4m wide

Existing heritage track way (concrete) to be retained / upgraded where required - to be used for public access

Indicative: Timber decking and balustrades to viewing points



Indicative: Timber decking pontoon / observation terrace

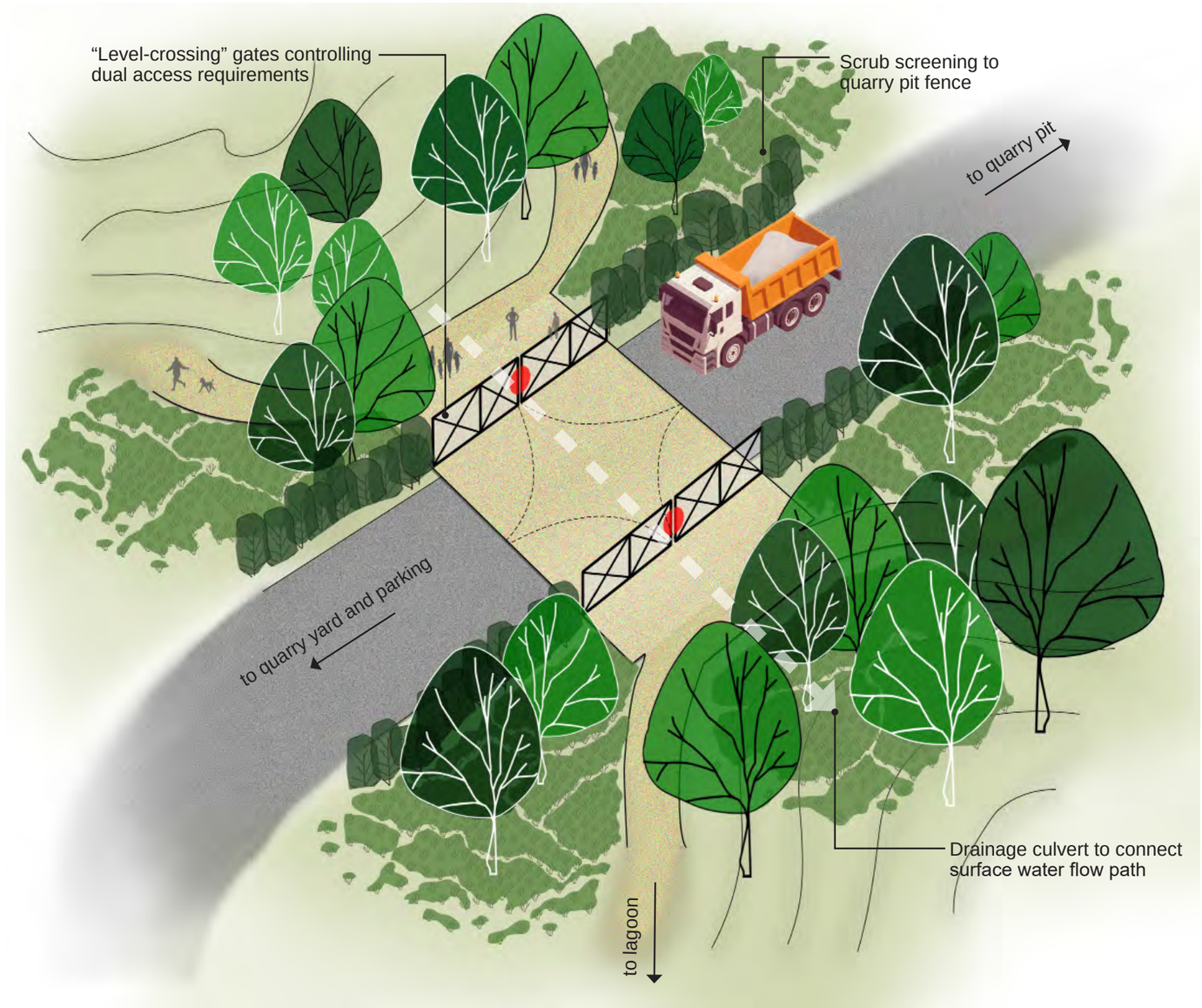
1.2m parapets with incorporated bird hide screens.

Indicative: Timber bird hide screen/wall built into sloped bank to lake foreshore, nested within existing scrub planting

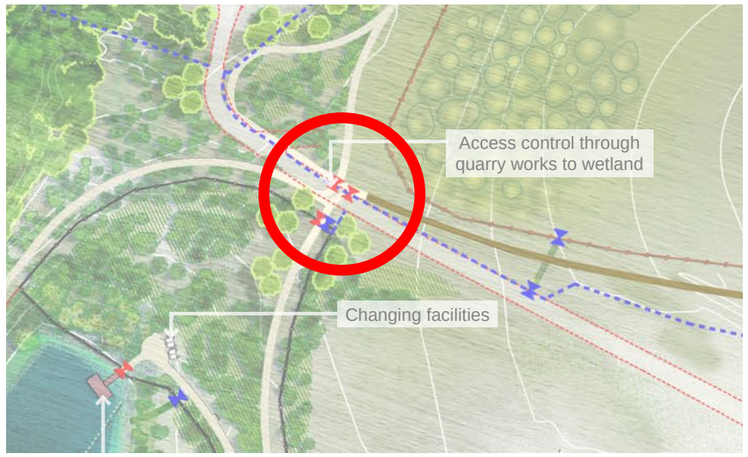
Landscape access
Interim Access Control (Phase 2)

During Phase 2 active quarry works the site will operate with an access control point for visitor safety:

- A level crossroad feature managing weekday quarry access / traffic running east-west and recreational access north-south (to wetland) will be in place for duration of Phase 2.
- On completion of Phase 2 - the western section of the access track will be retained for future use, in Phase 2 onwards, by the National Trust for park maintenance vehicle access.



Indicative sketch: Phase 2 Access Control point for quarry traffic / park visitors



Location: Control access point (adjacent access to swimming area)

Indicative: Control access point - with gated control to vehicle track during Phase 1

Indicative: Location of control access point on-site (current condition)

Landscape materiality
Hard surfacing and furniture - Visitor car park

Key

Reinforced gravel - Product: Truckpave with gravel to aisles

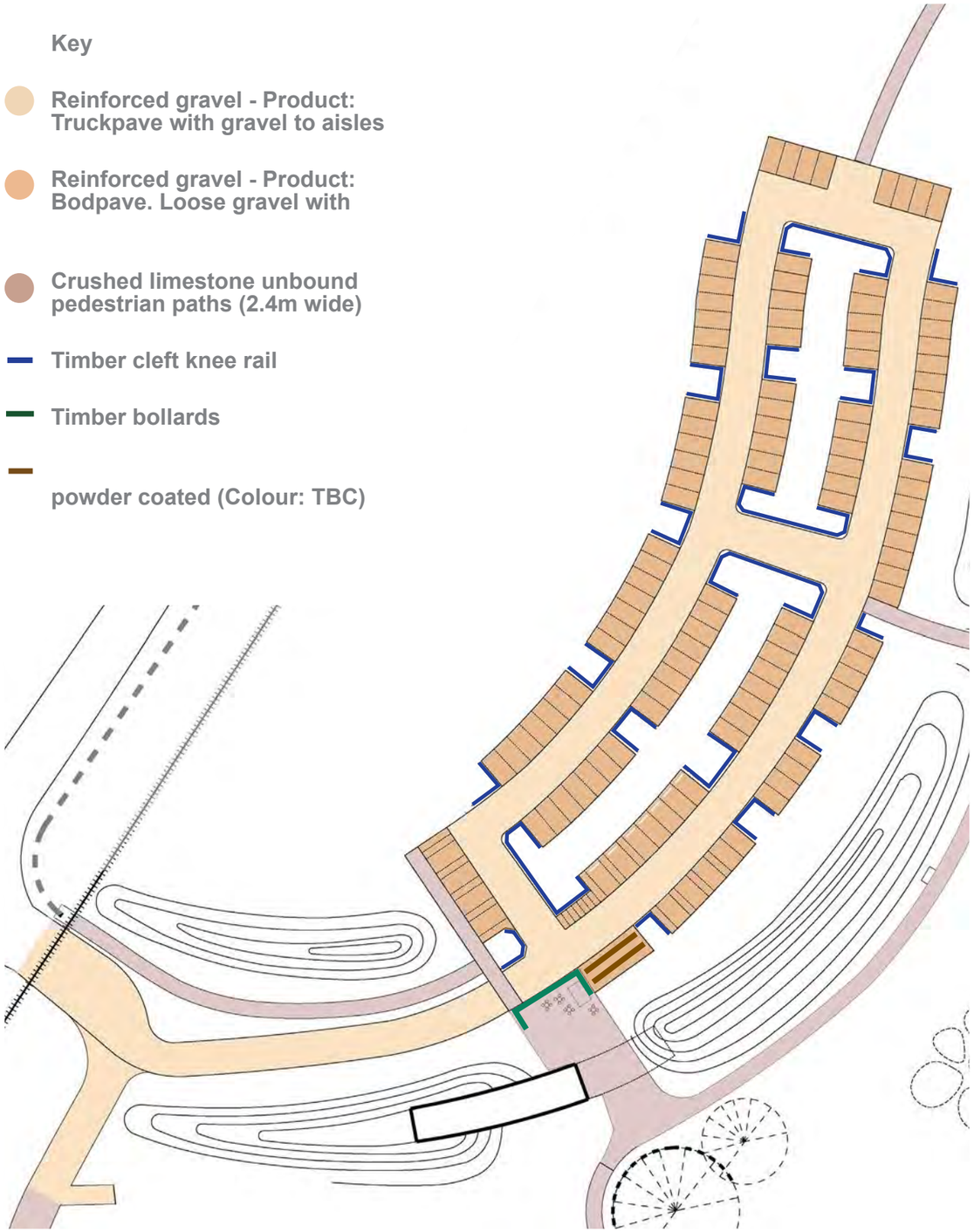
Reinforced gravel - Product: Bodpave. Loose gravel with

Crushed limestone unbound pedestrian paths (2.4m wide)

Timber cleft knee rail

Timber bollards

powder coated (Colour: TBC)



Truckpave with gravel to aisles

Bodpave - Loose shingle within cellular confinement grid for parking bays.

Timber knee rails to protect ground flora

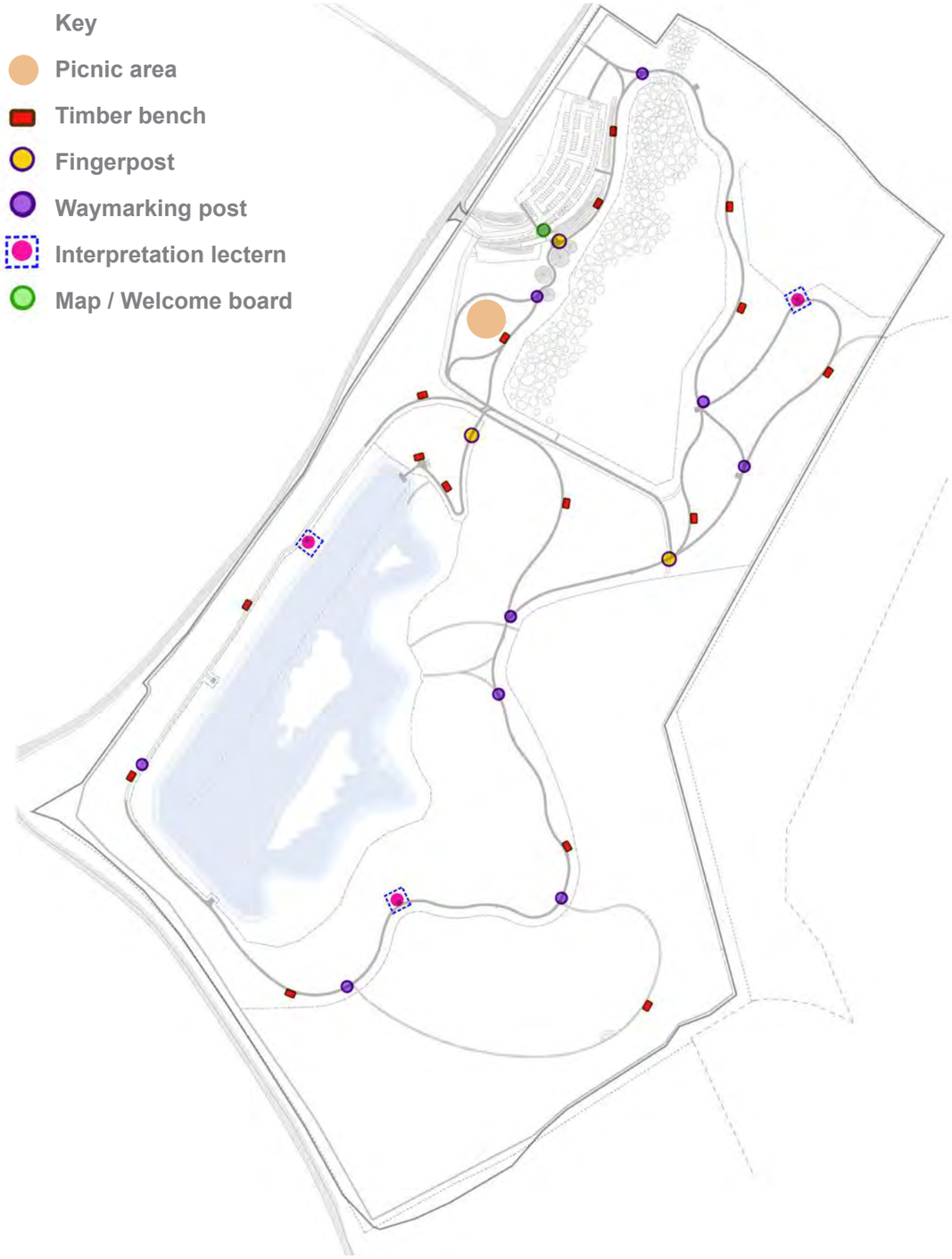
Timber bollards boundary to parkland gateway

Cycle stand, Sheffield style, dark green coating (TBC), root fixed. Located adjacent to welfare facilities.

Landscape materiality
Site furniture and signage: Site-wide

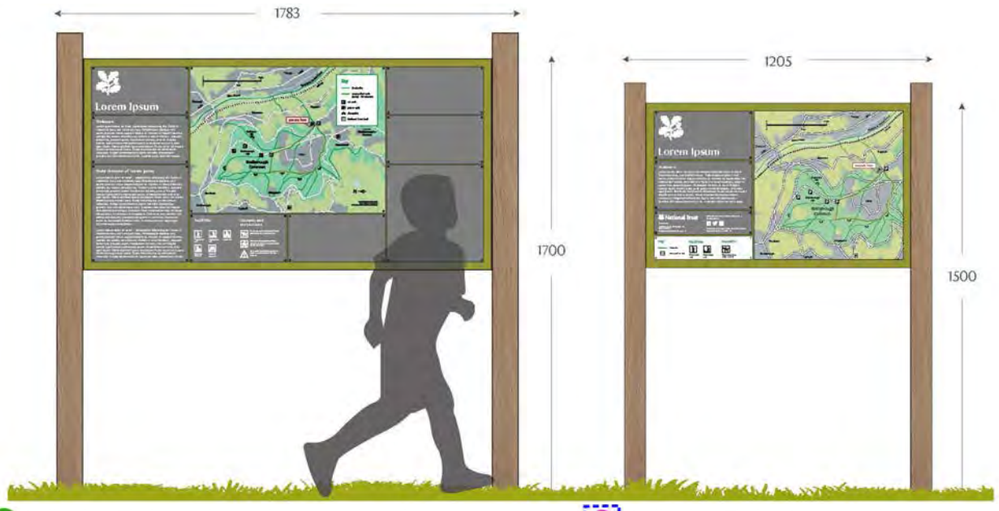
Key

- Picnic area
- Timber bench
- Fingerpost
- Waymarking post
- Interpretation lectern
- Map / Welcome board



Accessible timber picnic tables

Site-wide timber benches



Indicative: Timber welcome / entrance board

Indicative: Timber Interpretation lectern to viewing terraces (3No)

National Trust way marker signage

Indicative: Timber waymarking post

Indicative: Timber fingerpost

Landscape materiality
Fencing extents and type - Site wide

Key

Fencing:

- Post and wire stock fence - 1m height.
- Timber cleft fence - 1m height
- Timber cleft fence with wire mesh
- Boundary line - security fence

Gates:

- Timber swing gate - pedestrian access
- 5 bar timber swing gate - vehicle access
- Double leaf metal mesh - vehicle access
- Timber stile

Timber post and wire stock fence - 1m height.

2m high anti-climb security fencing, with double leaf vehicle gate to road entrance, (product: Zaun HiSec 358or similar approved)

Traditional timber Cleft fence

Timber Cleft fence with wire mesh panels where supporting grazing

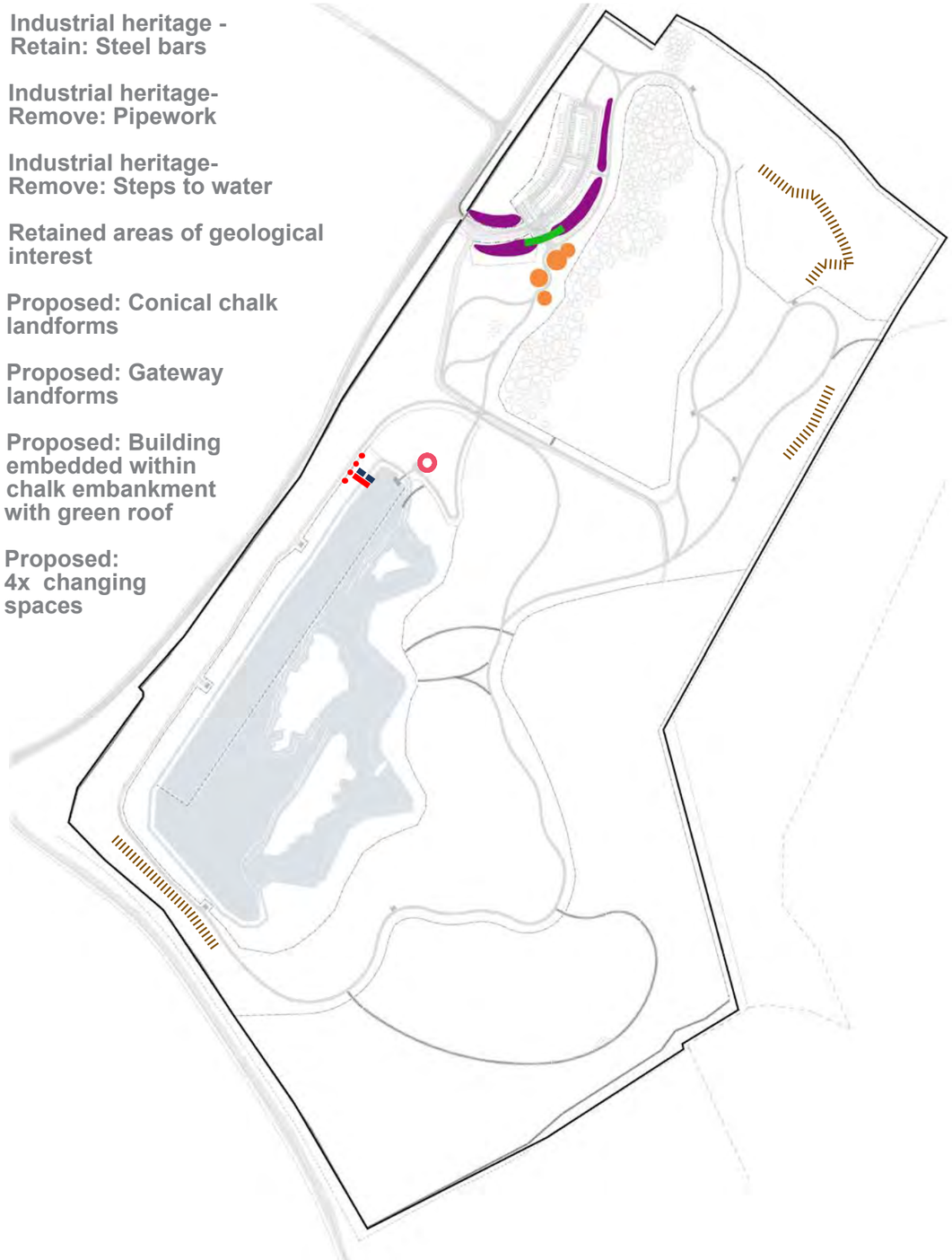
Timber pedestrian gate - 2 way self closing (product: Centrewire - or similar approved)

Timber pedestrian gate - 2 way self closing (product: Centrewire - or similar approved)

Landscape features
Key landscape and built elements - Site wide

Key

- Industrial heritage - Retain: Steel bars
- Industrial heritage- Remove: Pipework
- Industrial heritage- Remove: Steps to water
- Retained areas of geological interest
- Proposed: Conical chalk landforms
- Proposed: Gateway landforms
- Proposed: Building embedded within chalk embankment with green roof
- Proposed: 4x changing spaces



Existing: H-bar posts retained along path as industrial heritage features

Proposed: Indicative - building embedded within chalk embankment with green roof for site welfare

Existing: Chalk Cliff - feature of geological interest

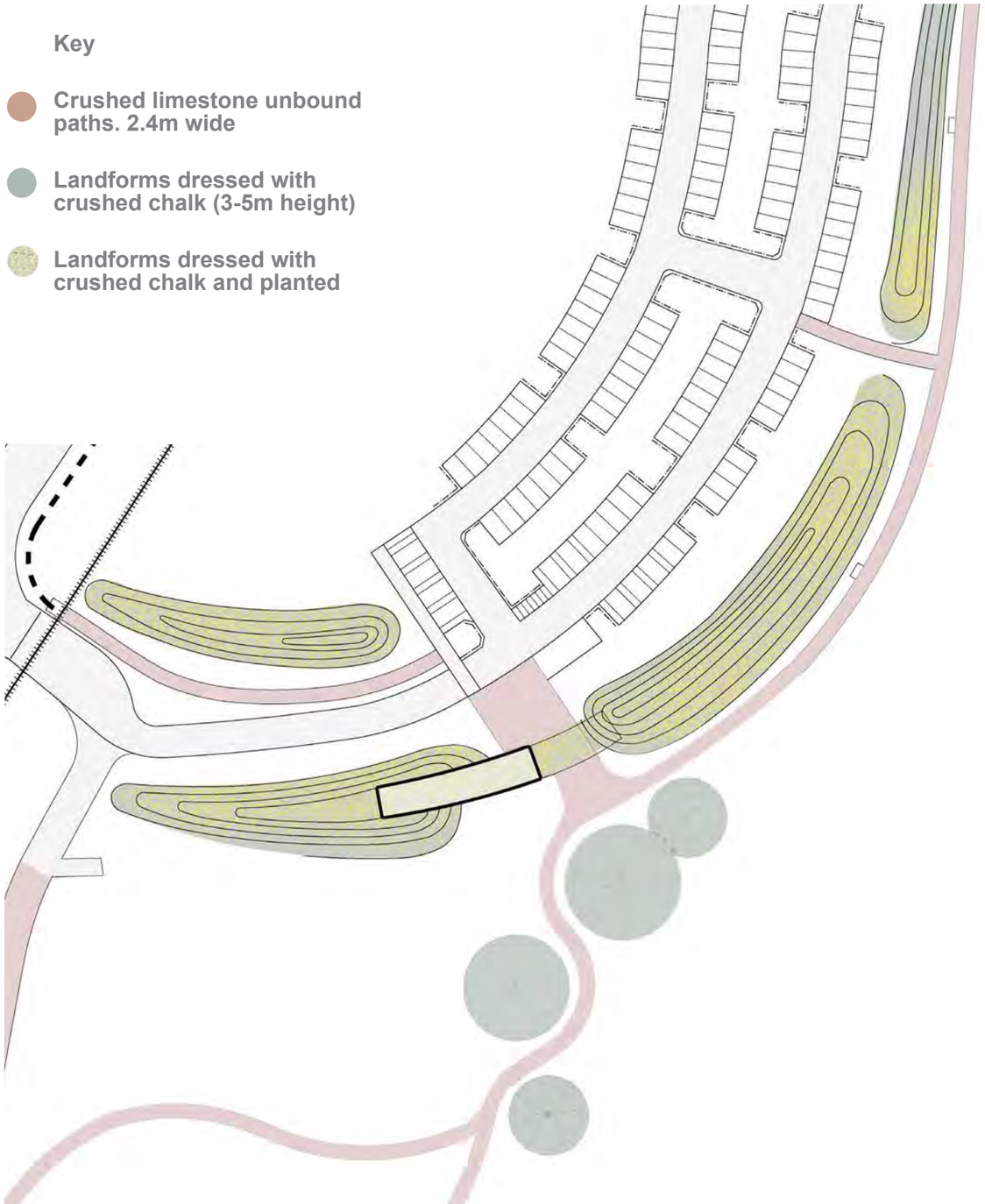
Proposed: Indicative - ‘off grid’ changing units / pods

Proposed: new chalk conical land forms at main entrance to celebrate the site history and use a chalk quarry

Landscape materiality
Hard landscape features - Parkland arrival

Key

- Crushed limestone unbound paths. 2.4m wide
- Landforms dressed with crushed chalk (3-5m height)
- Landforms dressed with crushed chalk and planted



Entrance feature: New landforms dressed with crushed chalk to both sides of the entrance road creating new site arrival and visibility screen to car park area

Site wide path routes: limestone paths through planting and through conical chalk landform feature

Landmark: Conical landforms dressed with crushed chalk. Feature echoing the historical quarry processes

Habitat Creation
Site wide seeding and planting strategy

Habitat Creation

In order for there to be successful habitat creation the site will recognise the existing site conditions, A long-term vision and landscape character will be achieved through establishment and maintenance best practise guidelines.

The majority of the site is to be managed grazed chalk grassland. Chalk grassland species will be allowed to regenerated naturally on the site over time supported by management and grazing regimes.

The vision for the site falls into four broad habitat types:

- Chalk Grassland regeneration
- Woodland Tree Planting
- Woodland Pasture / Scrub / Hedgerows
- Open water

Woodland / Tree Planting

The site has a number of existing trees and the proposals aim to replicate this native palette with the potential to add additional species found within the local landscape. Tree planting will be focused around the new proposed visitor car park and entrance area.

Trees will be selected from the below list.

Trees:

Quercus robur (English Oak)
Fagus sylvatica (Common Beech)
Salix alba (White Willow)
Acer campestre (Field Maple)

Wood Pasture / Scrub / Hedgerows

Native scrub, hedgerows and wood pasture provide the site with a range of habitat features. Utilising a native palette the vegetated areas will be managed to allow for the creation of rich wildlife habitats:

Scrub: managed in areas to create defensive thickets to control animal and people movement where not desired

Hedgerows: native species (excluding Blackthorn) planted to fence line boundaries and pedestrian areas to denote boundary lines and provide green corridors.

Wood pasture: mosaic habitat predominately found in areas that are subject to grazing regimes / browsing by large herbivores. Wood pasture landscape will be managed through grazing at edge of the chalk grasslands.

The site is largely enclosed by existing trees, and site wide includes scattered trees and scrub growth throughout that will be retained where feasible and managed to ensure a range of habitat opportunities are achieved, site security, and landscape legibility

Small trees and shrubs:

Corylus avelanna (Hazel)
Crataegus monogyna (Hawthorn)
Prunus spinosa (Blackthorn)
Euonymus europaeus (Spindle)
Ilex aquifolium (Holly)
Ligustrum vulgare (Common Privet)
Ulex europaeus (Gorse)
Rosa canina (Dog Rose)
Sorbus acuparia (Rowan)
Viburnum opulus (Guelder Rose)


Chalk grassland regeneration - managed through grazing


Crataegus monogyna (Hawthorn)


Euonymus europaeus (Spindle)


Fence lined with native hedgerow to publicly accessible areas


Corylus avelanna (Hazel)


Prunus spinosa (Blackthorn)

Habitat Creation
Site wide seeding and planting strategy

Chalk Grassland

The main open areas of land at the quarry post works will be allowed to naturally regenerate into a chalk grassland character over time.

Proposals will allow natural regeneration of grassland/meadow through seed colonisation from the local soil seed bank and seeds blown in. This will be controlled through annual maintenance regimes and grazing processes to create a diverse sward bespoke to the Chilterns AONB. Alongside natural regeneration, grassland areas may be supplemented with localised improvement techniques such as:

Harvesting and seeding from local chalk grassland - Utilising the Ashridge Estate to lift cuttings from the adjacent/neighbouring grassland, spreading the cuttings on the proposed area for enhancement and allowing the seed population to distribute whilst the hay is drying. This could be undertaken on future phased areas once an established grassland meadow is achieved during the initial landscape restoration stages.

Imported Seed - (e.g. to the entrance mounds) to promote the establishment of standard chalk grassland seed mixes. Seed import to be from approved and certified suppliers. Seed bed prepared as per supplier guidelines.

Should seed be imported to supplement regeneration there are several suppliers within 100km radius of Pitstone. The below is an indicative seed-mix composition of a typical Chalk Grassland from a commercial supplier.

Grasses

- Agrostis capillaris – Common Bent
- Anthoxanthum odoratum – Sweet Vernal-grass
- Briza media – Quaking Grass (w)
- Bromopsis erecta – Upright Brome
- Cynosurus cristatus – Crested Dogstail
- Festuca ovina – Sheep's Fescue
- Festuca rubra – Slender-creeping Red Fescue
- Trisetum flavescens – Yellow Oat-grass (w)

Habitat enhancement - Chalk topography for habitat variety, climate resilience and heritage interpretation: Located within grazed grassland, localised peaks and troughs within the landscape 'hills and holes' will celebrate the heritage of quarrying on the site whilst providing varied habitat opportunities through micro-climate changes and mounding to promote a wider range of species and climatic conditions at the micro level.

W (e.g. to entrance land form features)

- Poterium sanguisorba – Salad Burnet
- Plantago lanceolata – Ribwort Plantain
- Centaurea nigra – Common Knapweed
- Leucanthemum vulgare – Oxeye Daisy
- Malva moschata – Musk Mallow
- Silene vulgars – Bladder Campion
- Achillea millefolium – Yarrow
- Knautia arvensis – Field Scabious
- Ranunculus acris – Meadow Buttercup
- Galium verum – Lady's Bedstraw
- Centaurea scabiosa – Greater Knapweed
- Filipendula vulgaris – Dropwort
- Galium album – Hedge Bedstraw
- Primula veris – Cowslip
- Hippocrepis comosa – Horseshoe Vetch
- Lotus corniculatus – Birdsfoot Trefoil
- Linum catharticum – Fairy Flax
- Rumex acetosa – Common Sorrel
- Plantago media – Hoary Plantain
- Rhinanthus minor – Yellow Rattle
- Daucus carota – Wild Carrot
- Ranunculus bulbosus – Bulbous Buttercup
- Anthyllis vulneraria – Kidney Vetch

Marginal and Aquatic Planting

Natural regeneration of marginal and aquatic species to the waters edge will be the preferred process, allowing wetland species to colonise over time. Should planting be required to supplement the natural colonisation in the margins, species could include the following:

Wetlands

- Caltha palustris - Marsh Marigold
- Iris pseudacorus - Flag Iris
- Lysimachia vulgaris - Yellow Loosestrife
- Phragmites communis - Common Reed
- Typha angustifolia - Lesser Reedmace


Chalk grassland


Grass topography: Grimes Graves neolithic mining landscape


Chalk meadow grassland mix


Marginal wetland planting - Loosestrife

Plant Schedule
Proposed Site Plant Mixes

The adjacent schedule details the proposed plant palette mixes for each core soft work planting type proposed:

- Trees
- Hedges
- Scrub
- Meadow

Exact plant percentage mixes and numbers will be confirmed at detailed design.

Natural and managed regeneration is proposed for the site wide grasslands and any areas of marginal and aquatic planting to the existing water body.

Project: Pitstone Quarry - Landscape Restoration

Doc.no.: **LUC-12372-SCH-800_Planting schedule**
Title: PLANTING SCHEDULE

Total no. / quantity	Name	Specification	Tech.	Density
	Trees (Car Park / Entrance)			
38	Acer campestre (Field Maple)	Standard Nursery Stock; 2.0-2.5m height; 8-10cm Girth; breaks; min. 1.0m clear stem; Rootballed	A	Specimen
39	Fagus sylvatica (Common Beech)		A	Specimen
39	Quercus robur (English Oak)		A	Specimen
38	Salix alba (White Willow)		A	Specimen
	Hedges (Informal - 1m wide)			
900	Corylus avelana (Hazel)	Whip Nursery Stock; 60-80cm Height; Bare Root	B	4 pm
900	Crataegus monogyna (Hawthorn)		B	4 pm
900	Ligustrum vulgare (Common Privet)		B	4 pm
900	Rosa canina (Dog Rose)		B	4 pm
900	Viburnum opulus (Guelder Rose)		B	4 pm
	Scrub (Car park)			
210	Corylus avelana (Hazel)	Whip Nursery Stock; 60-80cm Height; Bare Root	B	0.75 psm
210	Crataegus monogyna (Hawthorn)		B	0.75 psm
210	Euonymous europaeus (Spindle)		B	0.75 psm
210	Ilex aquifolium (Common Holly)		B	0.75 psm
210	Rosa canina (Dog Rose)		B	0.75 psm
210	Ulex europaeus (Gorse)		B	0.75 psm
210	Viburnum opulus (Guelder Rose)		B	0.75 psm
	Scrub (Site Wide)			
5,875	Corylus avelana (Hazel)	Whip Nursery Stock; 60-80cm Height; Bare Root	B	0.75 psm
5,875	Crataegus monogyna (Hawthorn)		B	0.75 psm
5,875	Euonymous europaeus (Spindle)		B	0.75 psm
5,875	Ilex aquifolium (Common Holly)		B	0.75 psm
5,875	Ligustrum vulgare (Common Privet)		B	0.75 psm
5,875	Prunus spinosa (Blackthorn)		B	0.75 psm
5,875	Rosa canina (Dog Rose)		B	0.75 psm
5,875	Sorbus acuparia (Rowan)		B	0.75 psm
5,875	Ulex europaeus (Gorse)		B	0.75 psm
5,875	Viburnum opulus (Guelder Rose)		B	0.75 psm
	Meadow Seed Mix (Carpark / Entrance)			
2,560 sqm	EM6 Meadow Mixture for Chalk and Limestone Soils; Supplier: Emorsgate Seeds		40kg/ha - 16kg/acre - 4g/m2	
	Site Wide Natural Regeneratin			
	Note: Natural (managed) regeneration (i.e. no specified species to plant) for: - chalk grassland - marginal / aquatics to water body			na

Key:

Tech. A Tree staking method - 50mm dia. single stake (angled 45). Allow for 50Litres of clean imported soil per tree pit

Tech. B Single cane and rabbit guard

Note: Contractor to suggest availability of species and specification at tender stage and suggest alternatives were required.